TA-313

UK Model
AEP Model
E Model
Canadian Model

INTEGRATED STEREO AMPLIFIER

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND ⚠ MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ !

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY.

SPECIFICATIONS

GENERAL

Power Requirements: 240 V ac, 50 Hz (UK model)
220 V ac (or 120 or 240 V ac adjustable), 50 Hz (AEP model)
120, 220, or 240 V ac adjustable, 50/60 Hz (E model)
120 V ac, 60 Hz (Canadian model)

Power Consumption: 200 W (UK model)
170 W (AEP, E model)
85 W (Canadian model)

AC Outlets: (Canadian model) 1 switched, 100 W
2 unswitched, total 200 W

Dimensions: Approx. 410 (w) x 145 (h) x 280 (d) mm
16¼ (w) x 5¾ (h) x 11⅛ (d) inches
including projecting parts and controls.

Weight: Approx. 6.5 kg, 14 lb 6 oz (net)
Approx. 7.3 kg, 16 lb 2 oz (in shipping carton)

– Continued on page 2 –

SONY®
SERVICE MANUAL

AMPLIFIER SECTION

Continuous RMS Power Output: (rated output) (Less than 0.5% (8 Ω), 0.7% (4 Ω) harmonic distortion)
Both channels driven simultaneously
At 20 – 20,000 Hz
25 + 25 W (8 Ω)
At 1 kHz
28 + 28 W (8 Ω)
According to DIN 45500
25 + 25 W (8 Ω)

Power Bandwidth: 15 Hz – 30 kHz (8 Ω), IHF

Harmonic Distortion: Less than 0.5% at rated output
Less than 0.2% at 1 W output

IM Distortion: (60 Hz : 7 kHz = 4 : 1)
Less than 0.5% at rated output
Less than 0.2% at 1 W output

Frequency Response:
PHONO RIAA equalization curve ±0.5 dB
MIC 100 Hz – 10 kHz $^{+0}_{-3}$ dB
TUNER, AUX, TAPE } 10 Hz – 50 kHz $^{+0}_{-3}$ dB

Tone Controls:
BASS ±8 dB at 100 Hz
TREBLE ±8 dB at 10 kHz

Loudness: +8 dB at 100 Hz, att. 30 dB

Damping Factor: 30 (8 Ω, 1 kHz)

Inputs:

	Sensitivity	Impedance	Maximum Input Capability (at 1 kHz, 0.5% distortion)	S/N (weighting network, input level)
PHONO	2.5 mV	50 kΩ	100 mV	76 dB (A, 2.5 mV)
MIC	2.0 mV	10 kΩ	——	——
TUNER AUX TAPE	100 mV	50 kΩ	——	95 dB (A, 150 mV)

Outputs:

REC OUT	Voltage 150 mV	Impedance 10 kΩ
HEADPHONES	Accepts low and high impedance headphones	
SPEAKER	Accepts speakers of 8 – 16 Ω (Canadian model) or 4 – 16 Ω (AEP, UK, E model)	

0 dB = 0.775 V

- **MODEL IDENTIFICATION**
  – Specification Label–

UK model

SONY DAIGEN	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-313 AC 240 V ~ 50 Hz 200 W MADE IN JAPAN
	SERIAL NO.

E model

SONY DAIGEN	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-313 AC120, 220, 240 V ~ 50/60 Hz 170 W MADE IN JAPAN
	SERIAL NO.

AEP model

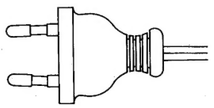
SONY	INTEGRATED STEREO AMPLIFIER MODEL NO TA-313 AC 220 V ~ 50 Hz 170 W MADE IN JAPAN
	SERIAL NO.

Canadian model

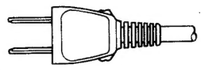
SONY DAIGEN	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-313 AC 120 V 60 Hz 85 W MADE IN JAPAN
SERIAL NO.	

– Power Cord –

E model: euro-plug (1-551-530-00)



E model: parallel-blade plug (1-534-487-XX)



SECTION 1
OUTLINE

1-1. REVERBERATION CIRCUIT

The TA-313 is equipped with a built-in reverberation unit designed to add a reverberation effect to the input signals from the MIC and TUNER input terminals. An outline of this circuit is shown in Fig. 1. This unit generates reverberation by the "spring" method, rather than the steel plate or echo room methods.

Fig. 2 illustrates the basic operating principle which employs a moving-magnet (MM)-type converter element.

Operating Principle

L301 in Fig. 1 serves as the actual reverberator unit, employing L1 as the load resistance for Q303.

When a signal is applied to the base of Q303, the amplified signal flows through L1, and a magnetic field will be generated as shown in Fig. 2, resulting in the L1 magnet being forced to rotate in a certain direction. The spring connected to the L1 magnet will also be forced to move in concert with the L1 magnet. But since the other end of this spring is connected to L2 magnet (again see Fig. 2), the current change in L1 will be transferred via the spring to L2. The movement of the L2 magnet then induces an electric current in the coil (in the same way as in a moving-magnet type cartridge), resulting in the voltage being applied to Q304. The time taken to transfer the signal from L1 to L2 is approx. 25 m sec.

In this way, signals applied to the base of Q303 are transferred to Q304 via L301 with the determined time delay. This action alone, however, will not produce the reverberation effect.

When the input signal ceases, the spring which has been forced to rotate together with the L1 magnet, will naturally tend to return to its original position, pulling the magnet back with it. But it will overshoot its original position, and wil oscillate (together with the magnet) for a short while until it finally comes to rest in its original position. This rotational oscillation action will result in the magnets at both ends (L1 and L2) overshooting their original positions a number of times, consequently generating proportionally smaller currents in both coils. Signals producing the reverberation effect are thus applied to Q304.

This oscillating spring behaviour may be more readily understood from the illustration in Fig. 3 which shows how a weight attached to the end of a spring gradually returns to its original position after being pulled down.

The signal from the L2 magnet is amplified by Q304 and Q305, and then applied to the mixing control RV301 via C312, R314 and R313. The signal applied to the base of Q303 is also applied directly to the mixing volume control RV301. RV301 adjusts the relative levels of the reverberated signal and non-reverberated signal, operating in much the same way as an ordinary balance control.

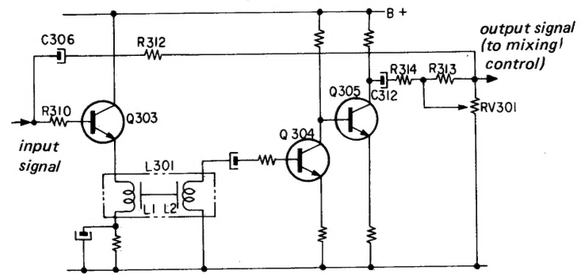


Fig. 1

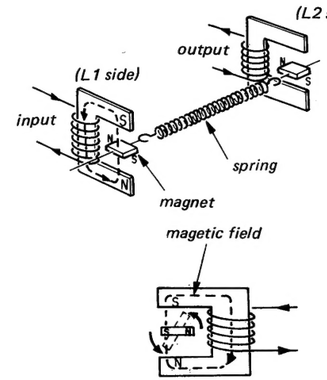


Fig. 2

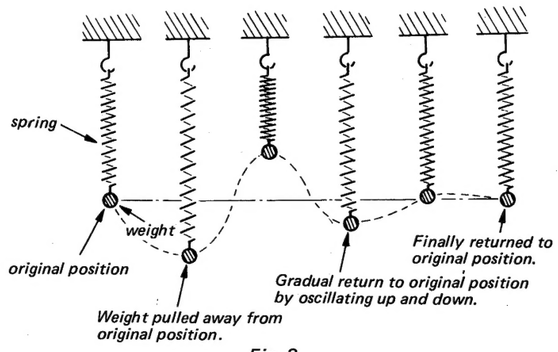
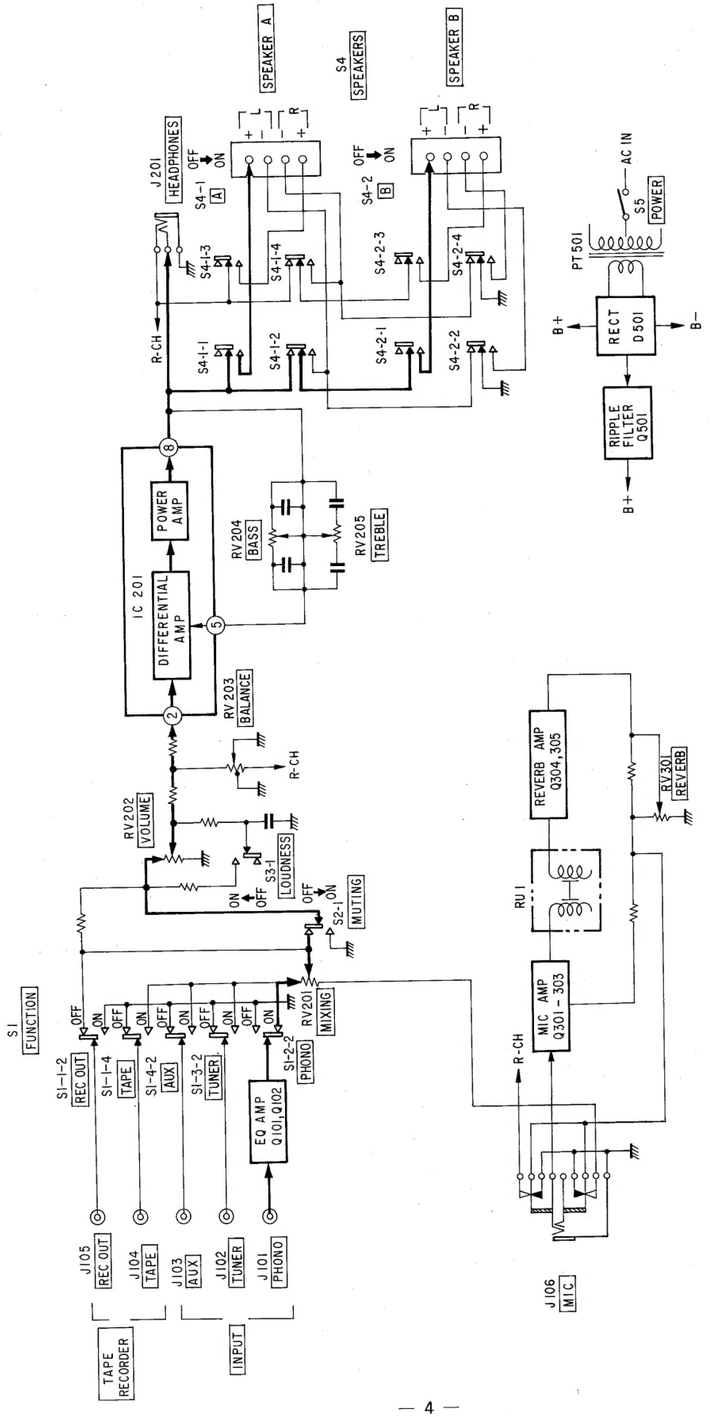


Fig. 3

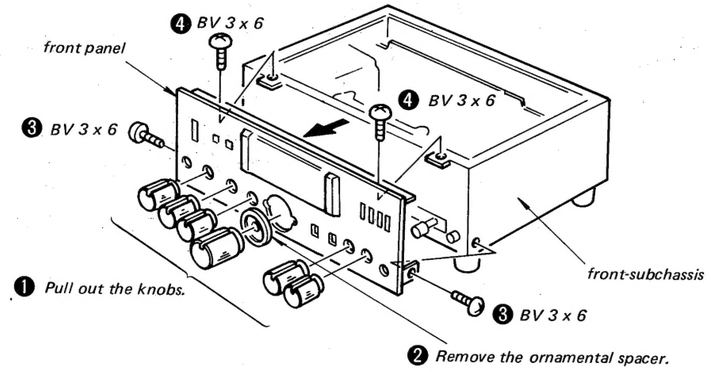
1-2. BLOCK DIAGRAM



SECTION 2
DISASSEMBLY

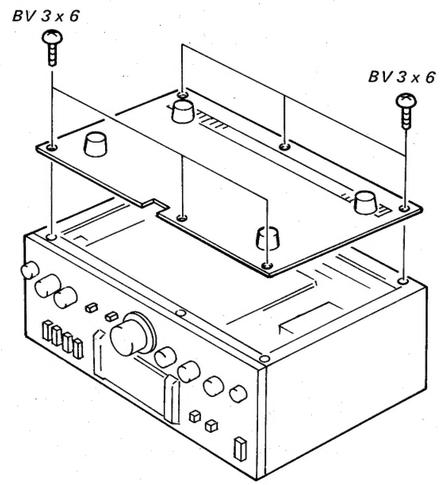
2-1. FRONT PANEL REMOVAL

- Follow the disassembly procedure in the numerical order given.



Do not bend the panel corners it may be damaged.

2-2. BOTTOM PLATE REMOVAL



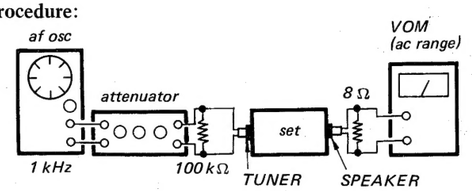
SECTION 3
ADJUSTMENT

Meter Level Adjustment

Setting:

FUNCTION switch: TUNER

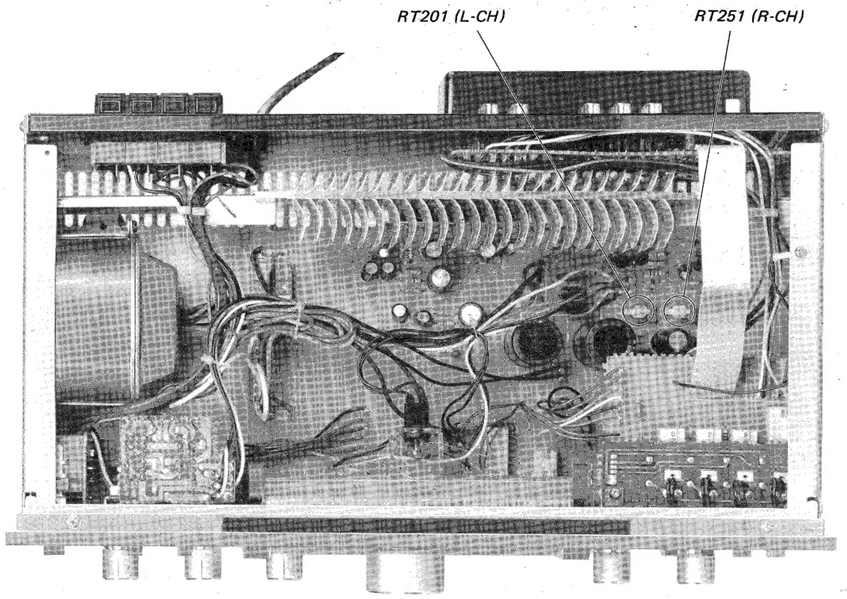
Procedure:



1. Turn the VOLUME control fully clockwise.
2. Adjust the TUNER input level for 2.83 V (1 W) reading on the VOM.
3. Adjust RT201 (L-CH) and RT251 (R-CH) so that the WATTS/8 Ω meter indicates 1 W.

Adjustment Location:

– power amp board –



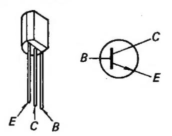
MEMO

SECTION 4
DIAGRAMS

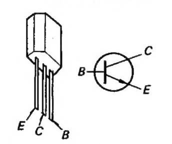
4-1. MOUNTING DIAGRAM

- **Replacement Semiconductors**
  For replacement, use semiconductors except in (   ).

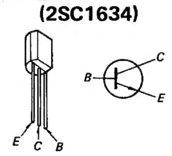
Q101, 102
Q151, 152 } : **2SC1362**
Q301–305



(2SC632A)

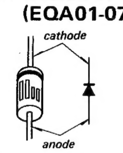


Q501: 2SC1364
(2SC1634)

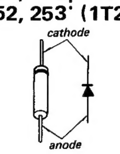


IC201: S1-1125HD

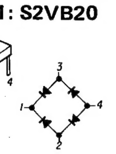
D201: EQB01-07
(EQA01-07R)



D202, 203 1T22AM
D252, 253 (1T22A)

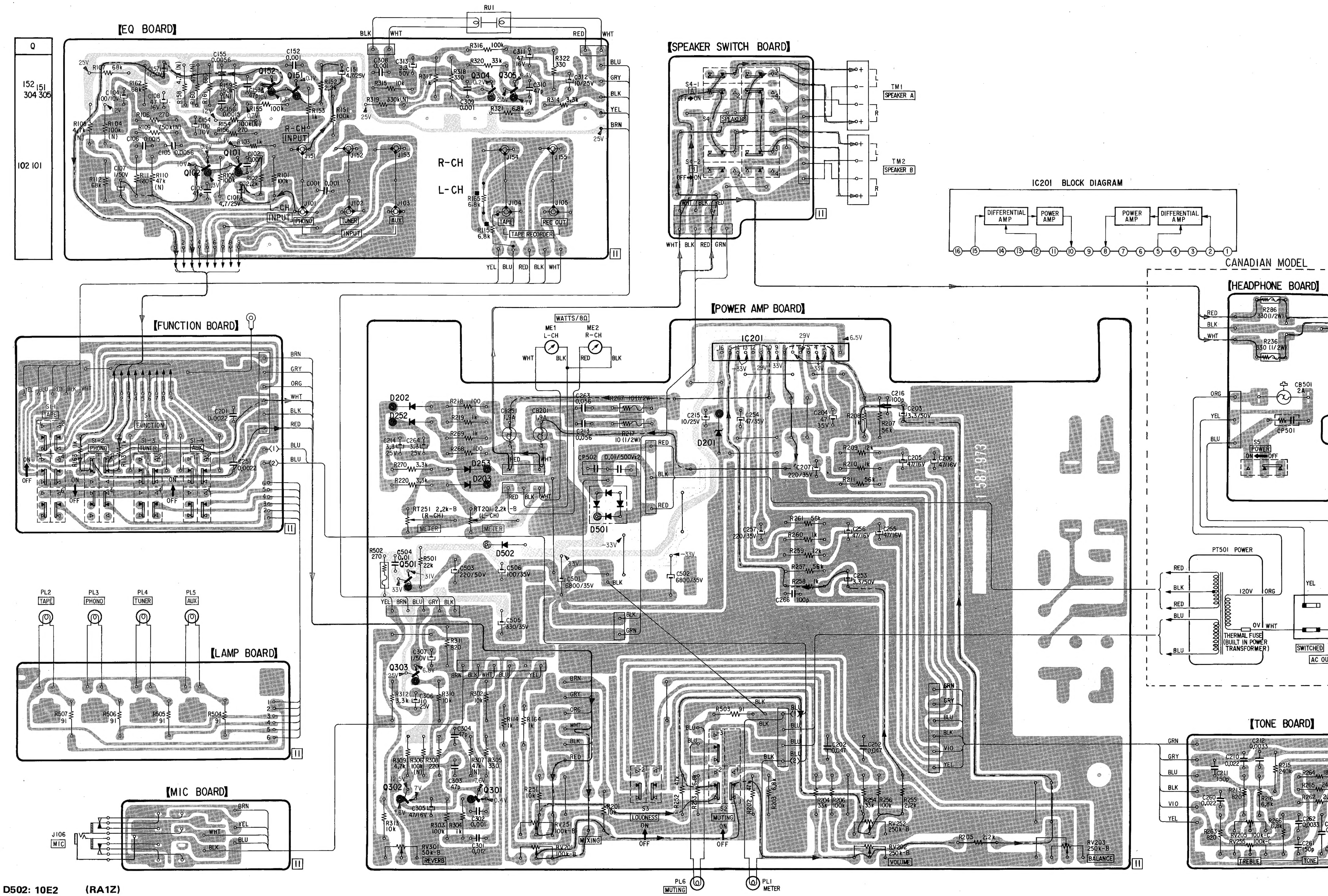


D501: S2VB20

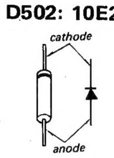


Note:

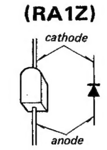
- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- : B+ pattern
- : B– pattern
- Signal Path
  —·—►: L-CH
  - - -►: R-CH
- Readings are taken under no-signal (detuned) conditions with a VOM (20 kΩ/V).



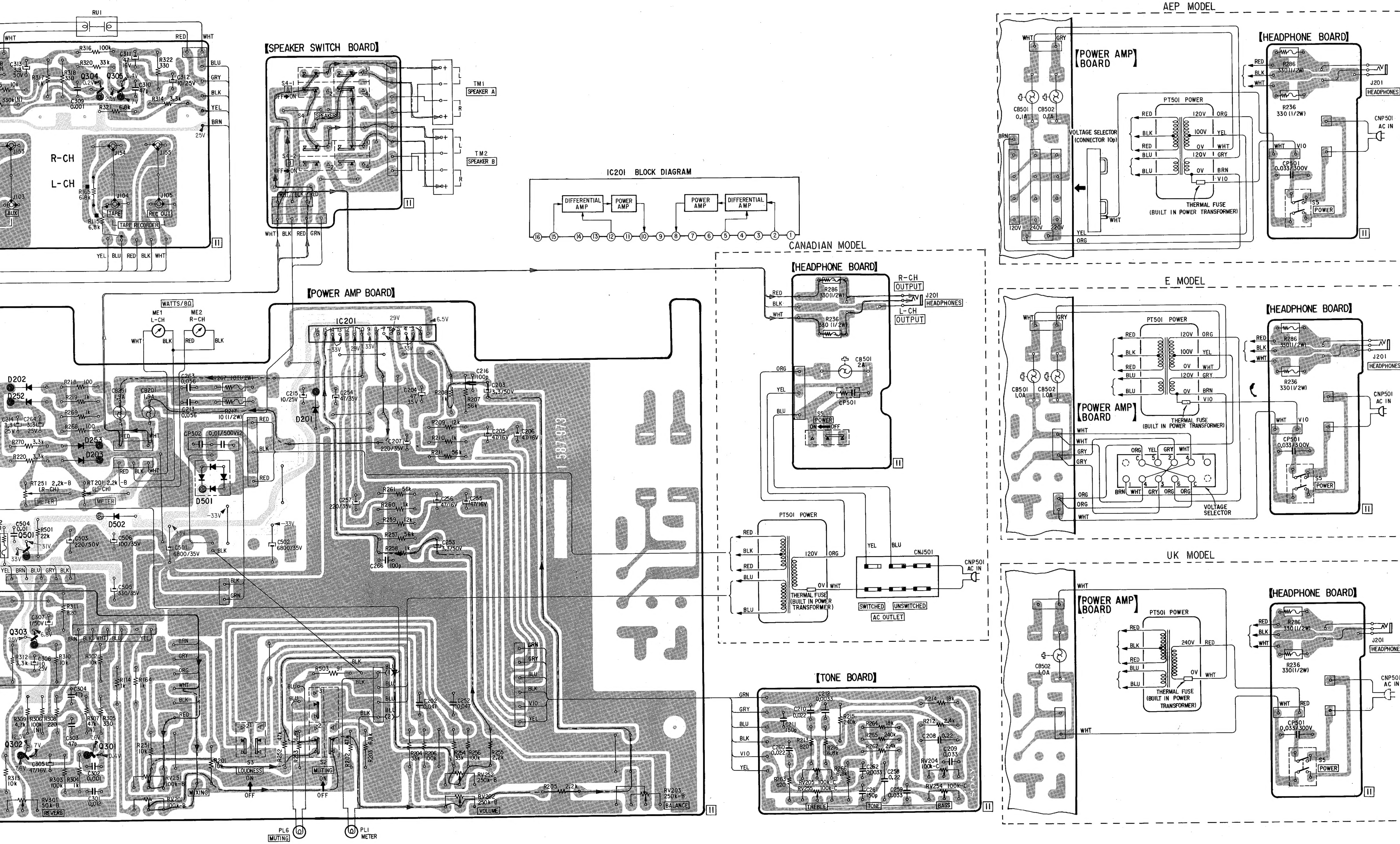
D502: 10E2



(RA1Z)

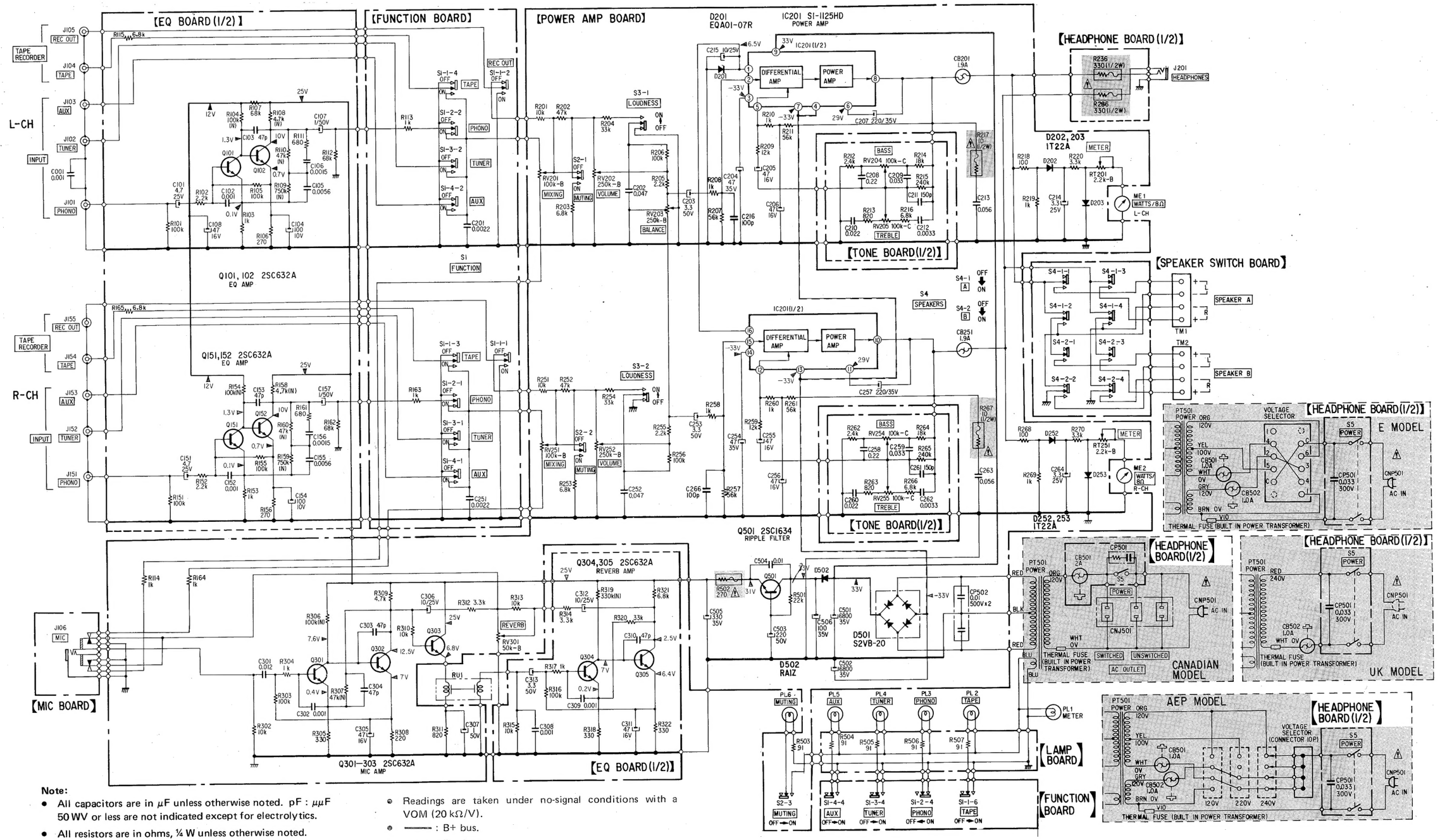


IC Q	501 303 302	301			IC201	
D	202 252	253 203	502	501	201	



501 303 302	301			IC201		
202 252	253 203	502	501	201		

4-2. SCHEMATIC DIAGRAM



Note:

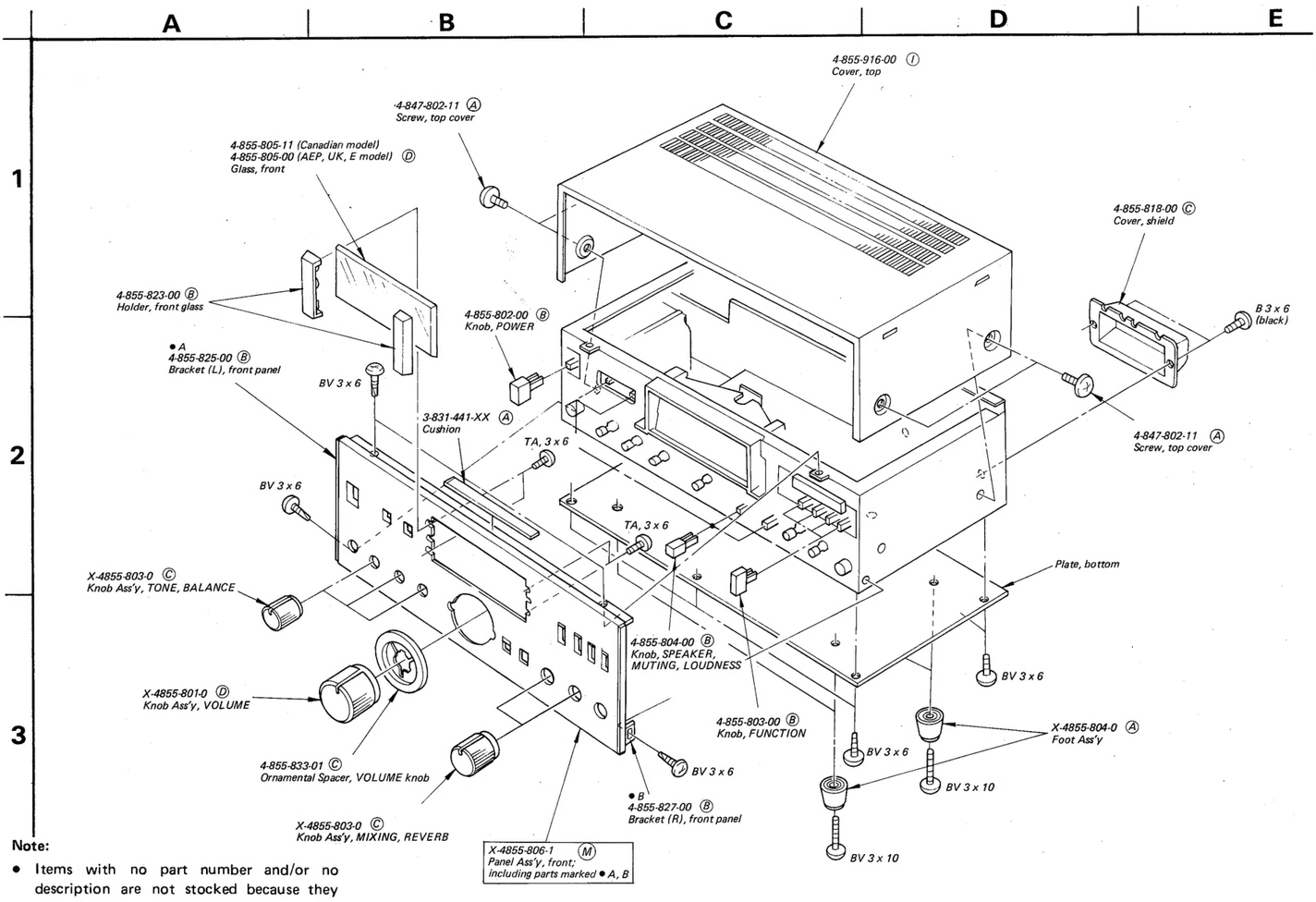
- All capacitors are in μF unless otherwise noted. pF : μμF 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms, ¼ W unless otherwise noted. KΩ : 1000 Ω; MΩ : 1000 kΩ
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- ⚠: nonflammable fusible resistor.
- (N) : low-noise resistor.
- ▭: panel designation.
- ▭: adjustment for repair.
- Readings are taken under no-signal conditions with a VOM (20 kΩ/V).
- ——— : B+ bus.
- - - - - : B− bus.
- Switch

Ref.No.	Switch	Position
S1	FUNCTION	PHONO
S2	MUTING	OFF
S3	LOUDNESS	OFF
S4	SPEAKERS	OFF
S5	POWER	OFF

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

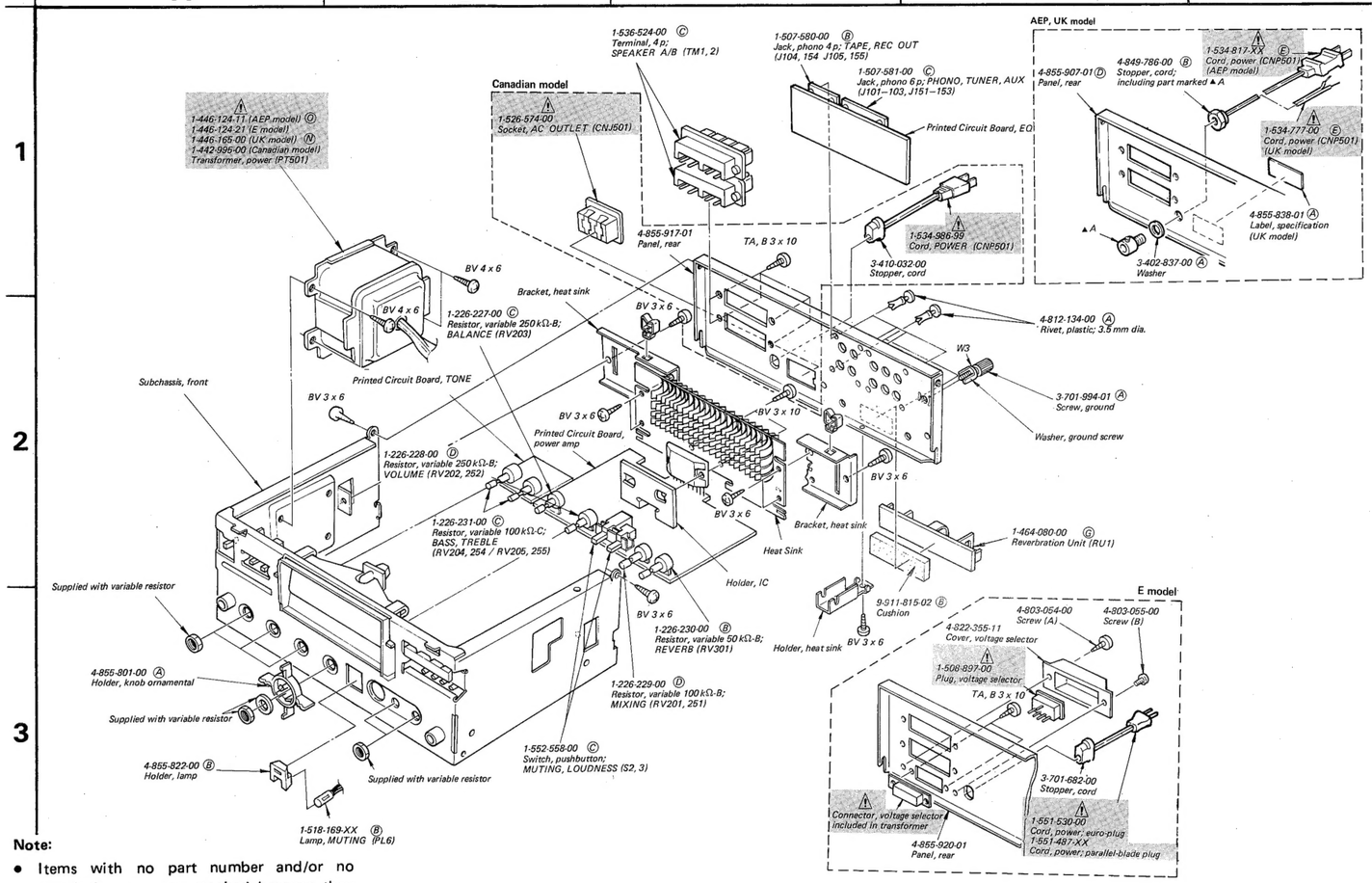
5-1.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

5-2.



Note:

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- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

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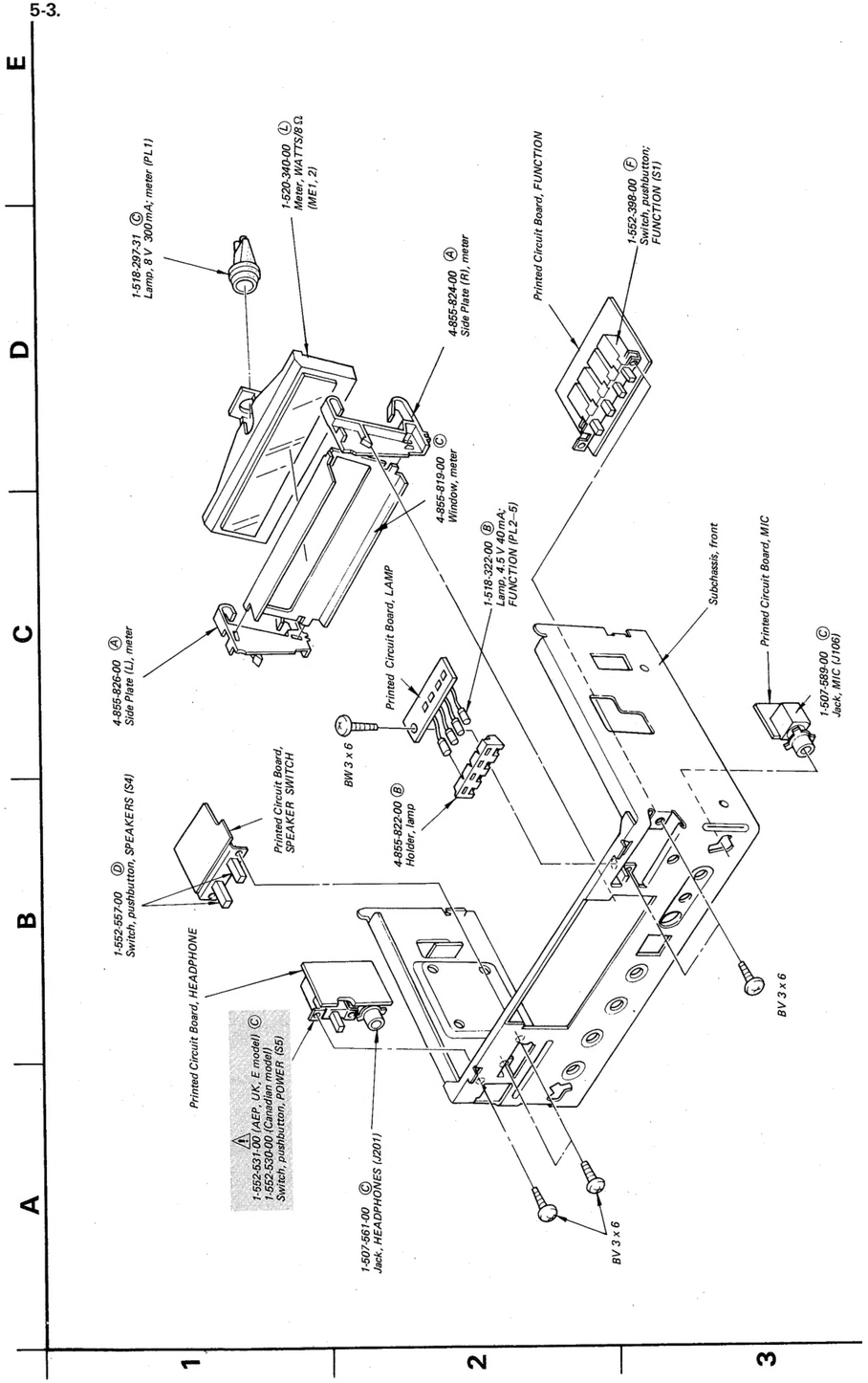
5-3.



Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (—) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SECTION 6
ELECTRICAL PARTS LIST

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	*Part No.*	*Description*
		SEMICONDUCTORS
		Transistors
⇒Q101, 151 ⇒Q102, 152 ⇒Q301–305	8-729-665-47	Ⓑ 2SC1362
⇒Q501	8-729-663-47	Ⓑ 2SC1364
		IC
IC201	8-759-301-25	Ⓛ S1-1125HD
		Diodes
⇒D201	8-719-931-07	Ⓑ EQB01-07
⇒D202, 252 ⇒D203, 253	8-719-422-21	Ⓐ 1T22AM
D501	8-719-502-20	Ⓒ S2VB20
⇒D502	8-719-200-02	Ⓑ 10E2
		CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted.
50 WV or less are not indicated except for electrolytics.
pF : μμF, elect : electrolytic.

Ref. No.	*Part No.*	*Description*		
C001	1-101-001-11	Ⓐ 0.001		
C101, 151	1-121-915-11	Ⓑ 4.7	25 V	elect
C102, 152	1-101-001-11	Ⓐ 0.001		
C103, 153	1-101-880-11	Ⓐ 47 p		
C104, 154	1-121-414-11	Ⓐ 100	10 V	elect
C105, 155	1-108-355-12	Ⓐ 0.0056		mylar
C106, 156	1-108-228-12	Ⓐ 0.0015		mylar
C107, 157	1-121-391-11	Ⓐ 1	50 V	elect
C108	1-121-409-11	Ⓐ 47	16 V	elect
C201, 251	1-108-230-12	Ⓐ 0.0022		mylar
C202, 252	1-108-246-12	Ⓐ 0.047		mylar
C203, 253	1-123-393-11	Ⓔ 3.3	50 V	elect
C204, 254	1-121-652-11	Ⓐ 47	35 V	elect
C205, 255 C206, 256	1-121-409-11	Ⓐ 47	16 V	elect
C207, 257	1-121-655-11	Ⓑ 220	35 V	elect
C208, 258	1-108-254-12	Ⓑ 0.22		mylar
C209, 259	1-108-244-12	Ⓐ 0.033		mylar
C210, 260	1-108-242-12	Ⓐ 0.022		mylar
C211, 261	1-101-361-11	Ⓐ 150 p		
C212, 262	1-108-232-12	Ⓐ 0.0033		mylar
C213, 263	1-108-361-11	Ⓐ 0.056		mylar
C214, 264	1-121-392-11	Ⓐ 3.3	25 V	elect
C215	1-121-398-11	Ⓐ 10	25 V	elect
C216, 266	1-102-973-11	Ⓐ 100 p		
C301	1-108-357-12	Ⓐ 0.012		mylar
C302	1-108-227-12	Ⓐ 0.001		mylar
C303, 304	1-101-880-11	Ⓐ 47 p		
C305	1-121-409-11	Ⓐ 47	16 V	elect
C306	1-121-398-11	Ⓐ 10	25 V	elect
C307	1-121-391-11	Ⓐ 1	50 V	elect
C308	1-108-227-12	Ⓐ 0.001		mylar
C309	1-101-001-11	Ⓐ 0.001		
C310	1-101-880-11	Ⓐ 47 p		
C311	1-121-409-11	Ⓐ 47	16 V	elect
C312	1-121-398-11	Ⓐ 10	25 V	elect
C313	1-121-652-11	Ⓐ 3.3	50 V	elect
C501, 502	1-125-155-11	Ⓔ 6800	35 V	elect
C503	1-121-423-11	Ⓑ 220	50 V	elect
C504	1-108-239-12	Ⓐ 0.01		mylar
C505	1-123-656-11	Ⓑ 330	35 V	elect
C506	1-121-261-11	Ⓑ 100	35 V	elect

RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omitted. Refer to the list on page 18 for their part numbers.
kΩ : 1000 Ω, MΩ : 1000 kΩ

R217, 267	⚠ 1-212-958-11	Ⓐ 10	½ W	fusible (nonflammable)
R236, 286	⚠ 1-211-626-11	Ⓐ 330	½ W	fusible (nonflammable)
R502	⚠ 1-212-891-11	Ⓐ 270	¼ W	fusible (nonflammable)
RT201, 251	1-224-643-XX	Ⓑ 2.2 k-B, adjustable; meter		
RV201, 251	1-226-229-00	Ⓓ 100 k-B, variable; MIXING		

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description
RV202, 252	1-226-228-00	(D) 250 k-B, variable; VOLUME
RV203	1-226-227-00	(C) 250 k-B, variable; BALANCE
RV204, 254 RV205, 255	1-226-231-00	(C) 100 k-C, variable; BASS, TREBLE
RV301	1-226-230-00	(B) 50 k-B, variable; REVERB
SWITCHES		
S1	1-552-398-00	(F) Pushbutton, FUNCTION
S2, 3	1-552-558-00	(C) Pushbutton, MUTING, LOUDNESS
S4	1-552-557-00	(D) Pushbutton, SPEAKERS
S5	⚠ 1-552-530-00	Pushbutton, POWER (Canadian model)
S5	⚠ 1-552-531-00	(C) Pushbutton, POWER (AEP, UK, E model)
JACKS		
J101–103 J151–153	1-507-581-00	(C) Phono, 6-p; PHONO, TUNER, AUX
J104, 154 J105, 155	1-507-580-00	(B) Phono, 4-p; TAPE, REC OUT
J106	1-507-589-00	(C) MIC
J201	1-507-561-00	(C) HEADPHONES
MISCELLANEOUS		
CB201, 251	1-532-380-61	(C) Circuit Breaker, 1.9 A
CB501	⚠ 1-532-486-12	Circuit Breaker, 2 A (Canadian model)
CB501	⚠ 1-532-535-00	(C) Circuit Breaker, 1.0 A (AEP, E model)
CB502	⚠ 1-532-535-00	(C) Circuit Breaker, 1.0 A (AEP, UK, E model)
CNJ501	⚠ 1-526-574-00	Socket, AC OUTLET (Canadian model)

Note: Circled letters ((A) to (Z)) are applicable to European models only.

Ref. No.	Part No.	Description
CNP501	⚠ 1-534-817-XX	(E) Cord, power (AEP model)
CNP501	⚠ 1-534-777-00	(E) Cord, power (UK model)
CNP501	⚠ 1-534-986-99	Cord, power (Canadian model)
CNP501	⚠ 1-534-487-XX	Cord, power; parallel-blade plug (E model)
CNP501	⚠ 1-551-530-00	Cord, power; euro-plug (E model)
CP501	⚠ 1-108-750-11	(C) Capacitor, 0.033 μF/300 V; mylar (AEP, UK, E model)
CP501	⚠ 1-231-341-00	Encapsulated Component (Canadian model)
CP502	1-102-355-00	(B) Capacitor, 0.01/500 V x 2; ceramic
ME1, 2	1-520-340-00	(L) Meter; WATTS/8 Ω
PL1	1-518-297-00	(C) Lamp, 8 V/300 mA; meter
PL2–5	1-518-322-00	(B) Lamp, 4.5 V/40 mA; FUNCTION
PL6	1-518-169-XX	(B) Lamp, 4.5 V/40 mA; MUTING
PT501	⚠ 1-446-124-11	(O) Transformer, power (AEP model)
PT501	⚠ 1-446-124-21	Transformer, power (E model) (including voltage selector)
PT501	⚠ 1-446-165-00	(N) Transformer, power (UK model)
PT501	⚠ 1-442-995-00	Transformer, power (Canadian model)
RU1	1-464-080-00	(G) Reverbration Unit
TM1, 2	1-536-524-00	(C) Terminal, 4-p; SPEAKER A/B
	⚠ 1-508-897-00	Plug, voltage selector (E model)

ACCESSORIES AND PACKING MATERIALS

Part No.	Description
3-701-630-00	(A) Bag, protector
3-770-554-11	(D) Manual, instruction
4-855-829-00	(B) Cushion
4-855-839-00	(D) Carton

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

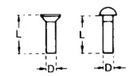
1/4 WATT CARBON RESISTORS (A)

Note: Circled letter (A) is applicable to European models only.

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-244-601-11	10	1-244-625-11	100	1-244-649-11	1.0k	1-244-673-11	10 k	1-244-697-11	100k	1-244-721-11	1.0M	1-244-745-11
1.1	1-244-602-11	11	1-244-626-11	110	1-244-650-11	1.1k	1-244-674-11	11 k	1-244-698-11	110k	1-244-722-11	1.1M	1-244-746-11
1.2	1-244-603-11	12	1-244-627-11	120	1-244-651-11	1.2k	1-244-675-11	12 k	1-244-699-11	120k	1-244-723-11	1.2M	1-244-747-11
1.3	1-244-604-11	13	1-244-628-11	130	1-244-652-11	1.3k	1-244-676-11	13 k	1-244-700-11	130k	1-244-724-11	1.3M	1-244-748-11
1.5	1-244-605-11	15	1-244-629-11	150	1-244-653-11	1.5k	1-244-677-11	15 k	1-244-701-11	150k	1-244-725-11	1.5M	1-244-749-11
1.6	1-244-606-11	16	1-244-630-11	160	1-244-654-11	1.6k	1-244-678-11	16 k	1-244-702-11	160k	1-244-726-11	1.6M	1-244-750-11
1.8	1-244-607-11	18	1-244-631-11	180	1-244-655-11	1.8k	1-244-679-11	18 k	1-244-703-11	180k	1-244-737-11	1.8M	1-244-751-11
2.0	1-244-608-11	20	1-244-632-11	200	1-244-656-11	2.0k	1-244-680-11	20 k	1-244-704-11	200k	1-244-728-11	2.0M	1-244-752-11
2.2	1-244-609-11	22	1-244-633-11	220	1-244-657-11	2.2k	1-244 681-11	22 k	1-244-705-11	220k	1-244-729-11	2.2M	1-244-753-11
2.4	1-244-610-11	24	1-244-634-11	240	1-244-658-11	2.4k	1-244-682-11	24 k	1-244-706-11	240k	1-244-730-11	2.4M	1-244-754-11
2.7	1-244-611-11	27	1-244-635-11	270	1-244-659-11	2.7k	1-244-683-11	27 k	1-244-707-11	270k	1-244-731-11	2.7M	1-244-755-11
3.0	1-244-612-11	30	1-244-636-11	300	1-244-660-11	3.0k	1-244-684-11	30 k	1-244-708-11	300k	1-244-732-11	3.0M	1-244-756-11
3.3	1-244-613-11	33	1-244-637-11	330	1-244-661-11	3.3k	1-244-685-11	33 k	1-244-709-11	330k	1-244-733-11	3.3M	1-244-757-11
3.6	1-244-614-11	36	1-244-638-11	360	1-244-662-11	3.6k	1-244-686-11	36 k	1-244-710-11	360k	1-244-734-11	3.6M	1-244-758-11
3.9	1-244-615-11	39	1-244-639-11	390	1-244-663-11	3.9k	1-244-687-11	39 k	1-244-711-11	390k	1-244-735-11	3.9M	1-244-759-11
4.3	1-244-616-11	43	1-244-640-11	430	1-244-664-11	4.3k	1-244-688-11	43 k	1-244-712-11	430k	1-244-736-11	4.3M	1-244-760-11
4.7	1-244-617-11	47	1-244-641-11	470	1-244-665-11	4.7k	1-244-689-11	47 k	1-244-713-11	470k	1-244-737-11	4.7M	1-244-761-11
5.1	1-244-618-11	51	1-244-642-11	510	1-244-666-11	5.1k	1-244-690-11	51 k	1-244-714-11	510k	1-244-738-11	5.1M	1-244-762-11
5.6	1-244-619-11	56	1-244-643-11	560	1-244-667-11	5.6k	1-244-691-11	56 k	1-244-715-11	560k	1-244-739-11		
6.2	1-244-620-11	62	1-244-644 11	620	1-244-668-11	6.2k	1-244-692-11	62 k	1-244-716-11	620k	1-244-740-11		
6.8	1-244-621-11	68	1-244-645-11	680	1-244-669-11	6.8k	1-244-693-11	68 k	1-244-717-11	680k	1-244-741-11		
7.5	1-244-622-11	75	1-244-646-11	750	1-244-670-11	7.5k	1-244-694-11	75 k	1-244-718-11	750k	1-244-742-11		
8.2	1-244-623-11	82	1-244-647-11	820	1-244-671-11	8.2k	1-244-695-11	82 k	1-244-719-11	820k	1-244-743-11		
9.1	1-244-624-11	91	1-244-648-11	910	1-244-672-11	9.1k	1-244-696-11	91 k	1-244-720-11	910k	1-244-744-11		

HARDWARE NOMENCLATURE

Screw: — P 3 x 10
- L: Length in mm
- D: Diameter in mm
- Type of head
- Indicated slotted-head only. Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring:
N 3
- Diameter of usable screw or shaft
- Reference designation

Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

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